REMARKS

A substitute paragraph has been submitted to correct an error found on page 10 of the specification while reviewing the case in preparation for the response to the office action. No new matter is involved as the error was grammatical in nature.

The Examiner objected to Claims 31 and 37 for lack of antecedent basis. Accordingly, the applicants have amended Claim 31 to correct the informality and thank the Examiner for pointing out the apparatus language used erroneously in this method claim. With reference to Claim 37, the language objected to, "said out-of-plane deformation of the object surface," is recited in the preamble of Claim 18, from which Claim 37 depends. Therefore, no correction is believed to be necessary.

Claims 14-17 and 32-35 were rejected as indefinite as a result of the recitation of "applied uniformly," "applied non-uniformly," and "throughout the object surface," which the Examiner deemed vague. Therefore, the language was amended in Claims 14-15 and 32-33 to more clearly recite the intended limitation. Claims 16-17 and 34-35 appear to have been listed mistakenly among the rejected claims because they do not contain the mentioned language; therefore, they were not amended.

In response to the Examiner's question in Section 2 of the office

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action ("How is the means for changing applied throughout on the object surface?"), the applicants note that interferometric profilometry is carried out by producing interferograms pixel by pixel over a sample surface; that is, each pixel is scanned to produce corresponding fringes as the OPD is varied with respect to that pixel. In order to produce the profile of a given surface area, all surface pixels are scanned at a nominal rate of phase change and analyzed in the same manner. According to the present invention, that nominal rate is modified to track the out-of-plane deformation of the object surface at the pixel being scanned. Such deformation may or may not be the same across all surface pixels. Accordingly, the modification to the nominal rate introduced by the invention may or may not be uniform across the surface, as well. Claims 14-15 and 32-34 reflect these two situations.

The Examiner rejected Claims 1-13, 18-31 and 36 under 35 U.S.C. 103(a) as unpatentable over Olszak et al. (U.S. Patent No. 6,624,894). This patent, co-authored by one of the same inventors involved in the present application, describes the use of a reference signal to track the actual behavior of the scanner (as contrasted with its nominal design behavior) in an interferometer to produce scanner-position data that can be used to correct errors introduced by scanner nonlinearities and other error sources. The patent teaches the use of the reference signal to ascertain the actual position of the scanner at each

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frame-acquisition time so that the actual phase step of the instrument, rather than the nominal phase step, can be used in the analysis of the interferograms produced by the scan. The patent does not describe or suggest the concept of changing the nominal rate of the scanner in order to track an out-of-plane motion of the sample surface. Inasmuch as such motion is not a concern of the invention, no structure or methodology is disclosed that could produce this result.

As claimed, the apparatus of the present invention includes the recitation of "means for changing said predetermined nominal rate such that each phase change between successive data-acquisition frames falls within an operational window of the algorithm." Similar language is recited in the method claims. The Examiner found that the Olszak invention, though directed to a totally different concept, is sometimes capable of producing the claimed phase change, thereby meeting the claim limitation. (See page 4 of the Office Action, starting at line 7.) Since this condition is insufficient to support a finding of inherent anticipation (which requires that the limitation be necessarily met, even if unintended), it appears that the Examiner nonetheless found it sufficient to support a rejection based on obviousness.

The applicants respectfully disagree because the present invention is based on a totally separate and independent concept from the one involved in the Olszak et al. patent. There is

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absolutely nothing in that disclosure that would motivate one skilled in the art to change the nominal scanning rate in any way other than to reflect the actual motion of the scanner (that is, to correct errors). The concept of keeping the phase change between frames within the operational window of the algorithm (as that is defined for this invention) is totally foreign to that disclosure. The correction provided by the reference signal of the Olszak patent is used only to remove scanner errors; that is, to solve a different problem than that addressed by the applicants (a problem that remains to be addressed as well in the context of the present invention). As a matter of fact, Claims 13 and 31 are directed to the additional step of correcting the nominal phase step using the reference signal taught by the Olszak patent. The fact that such correction may sometimes also cause the phase change between successive data-acquisition frames to fall within the operational window of the algorithm does not render the present invention obvious without some teaching to that effect. In fact, that correction alone would typically never produce the claimed result if a sufficient out-of-plane motion were present in the object surface, which is the additional problem addressed by this invention.

Since the pending claims, as filed, did not contain language related to the actual calculation of the out-of-plane deformation, both independent Claims 1 and 18 have been amended to recite this additional limitation, which is clearly supported

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by the specification of the invention (see, for example, page 11, lines 5-9; page 24, lines 17-20; and page 26, lines 20-24). Thus, as amended, the distinction between the present invention and the Olszak patent is further clarified. Note, for example, Fig. 4 of the pending application, which is the same as Fig. 6 of the Olszak patent but in addition discloses the scanner motion component and the related driver electronics designed to track the object motion, which represent the essence of the present invention and are absent in the teachings of Olszak et al. As discussed above, nothing in the referenced patent relates to this concept.

In view of the foregoing, independent Claims 1 and 18, as well as Claims 2-17 and 19-37 that depend therefrom, are believed to recite patentable subject matter. Therefore, reconsideration of the rejection is respectfully requested.

The Examiner indicated that Claim 38 would be allowable if rewritten in independent form. Therefore, the claim was amended to incorporate the limitations of Claim 18, from which it depended.

The applicants and their attorney thank the Examiner for his help in identifying the mentioned errors in the claims.

A Credit Card Form for a one-month extension fee is enclosed with

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the extension request form. No other fee is believed to be due because the total number of claims remains the same and only three independent claims are pending after amendment. Please charge any other amount deemed to be due with this response to our Deposit Account No. 04-1935.

Respectfully submitted,

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